Potentiometric Surface Map of the Bedrock Aquifers of Morgan County, Indiana

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Morgan County, Indiana is located in the central portion of the state and is situated within the White and West Fork White River Basin.

The Bedrock Potentiometric Surface Map (PSM) of Morgan County was mapped by contouring the elevations of over 1,350 static water-levels reported on well records received over a 50 year period. These wells are completed in bedrock aquifers at various depths, and typically, under confined conditions (bounded by impermeable layers above and below the water bearing formation). However, some wells were completed under unconfined (not bounded by impermeable layers) settings. The potentiometric surface is a measure of the pressure on water in a water bearing formation. Water in an unconfined aquifer water table is at atmospheric pressure and will not rise in a well above the top of the water bearing formation, in contrast to water in a confined aquifer which is under hydrostatic pressure and will rise in a well above the top of the water bearing formation.

Static water-level measurements in individual wells used to construct county PSM's are indicative of the water-level at the time of well completion. The groundwater level within an aquifer constantly fluctuates in response to rainfall, evapotranspiration, groundwater movement, and groundwater pumpage. Therefore, current site specific conditions may differ due to local or seasonal variations in measured static water-levels. Because fluctuations in groundwater are typically small, static water-levels can be used to construct a generalized PSM. Groundwater flow is naturally from areas of recharge toward areas of discharge. As a general rule, but certainly not always, groundwater flow approximates the overlying topography and intersects the land surface at major streams.

Universal Transverse Mercator (UTM) coordinates for the water wells were either; physically obtained in the field, determined through address geocoding, or reported on water well records; however, the location of the majority of the water well records used to make the PSM were not field verified. Elevation data were either obtained from topographic maps or a digital elevation model. Quality control/quality assurance procedures were utilized to refine or remove data where errors were readily apparent.

Bedrock potentiometric surface elevations in Morgan County range from a high of approximately 900 feet mean sea level (msl) in the north-central region of the county, to a low of about 500 feet msl in the central portion of the county. Generalized groundwater flow direction

for most of Morgan County is towards major drainage relevant to the basin. Therefore, groundwater flow is generally southwest toward White River in the southern portion of the county or toward Mill Creek in the northern portion of the county.

Much of the Morgan County bedrock surface is overlain by unconsolidated deposits that range from less than one foot, to an estimated 250 feet in thickness (Maier, 2010). Where bedrock is shallow, the potentiometric surface is generally under unconfined or semi-confined conditions. However, most of Morgan County is covered by thicker sediments overlying bedrock. Therefore, the potentiometric surface for most of the county is considered under confined conditions.

The county PSM can be used to define the regional groundwater flow path and to identify significant areas of groundwater recharge and discharge. County PSM's represent overall regional characteristics and are not intended to be a substitute for site-specific studies.

Maier, 2010, Bedrock Aquifer Systems of Morgan County, Indiana: Indiana Department of Natural Resources, Division of Water, Aquifer Systems Map 70-B